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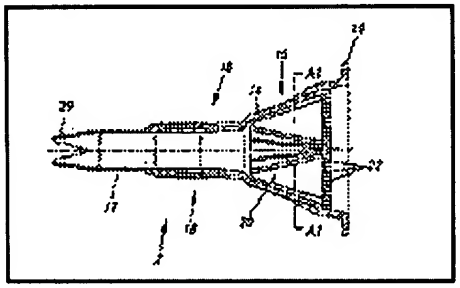
Title: (EN) SYSTEM FOR APPLYING PASTY MASSES
(FR) OUTIL D'APPLICATION DE MASSES PATEUSES

Abstract: (EN) A system for applying pasty two-component masses stored in tubular bags, consists of a base unit (1), equipped with a hollow cylindrical chamber. At the front of the system an extrusion arrangement (2) is installed, equipped with means to activate the two-component mass. A press-out piston to empty the tubular bags, which can be displaced electromechanically, is located inside the base unit (1). The piston has a recess to receive the emptied tubular bag. To facilitate the removal of the folded tubular bag, a ring is provided that can be pushed onto the piston, and which prevents the tubular bag wrap from adhering smoothly to the piston's recess. In this manner, the tubular bag - together with the ring - can be pulled off the piston without great exertion.



(FR) L'invention porte sur un outil d'application de masses pâteuses à deux composants stockées dans des sacs tubulaires, consistant: en une unité de base (1) pourvue d'une chambre cylindrique creuse et, en position distale, d'un dispositif d'extrusion (2) muni d'un moyen d'activation de la masse à deux composants; en un piston presseur, éventuellement à commande électromagnétique, servant à expulser la masse du sac, placé dans l'unité de base (1), et comportant un évidement destiné à recevoir le sac vidé. Pour faciliter l'extraction du sac tubulaire pliée, il est prévu un anneau pouvant être poussé sur le piston de manière à empêcher l'enveloppe du sac d'adhérer légèrement à l'évidement. On peut ainsi retirer du piston le sac tubulaire et l'anneau sans grand effort.

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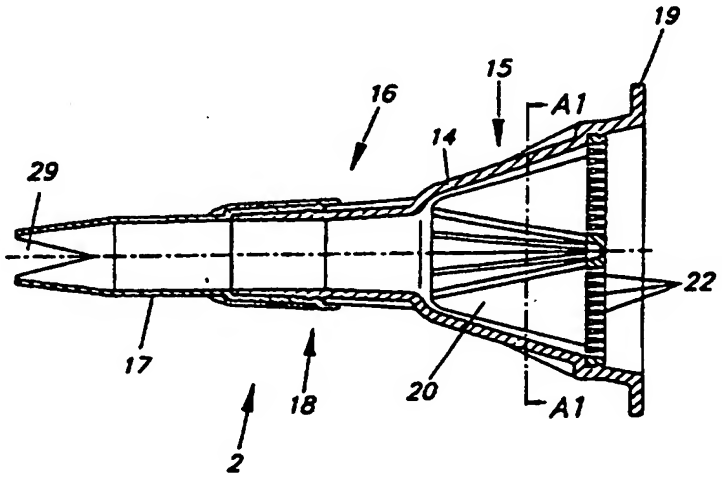
(57) Abstract

A system for applying pasty two-component masses stored in tubular bags, consists of a base unit (1), equipped with a hollow cylindrical chamber. At the front of the system an extrusion arrangement (2) is installed, equipped with means to activate the two-component mass. A press-out piston to empty the tubular bags, which can be displaced electromechanically, is located inside the base unit (1). The piston has a recess to receive the emptied tubular bag. To facilitate the removal of the folded tubular bag, a ring is provided that can be pushed onto the piston, and which prevents the tubular bag wrap from adhering smoothly to the piston's recess. In this manner, the tubular bag - together with the ring - can be pulled off the piston without great exertion.



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SYSTEM FOR APPLYING PASTY MASSES

The invention refers to a system for the application of pasty masses, such as adhesive materials.

Today, sausage packages, tubular bags, are often used, instead of cartridges, to receive and store pasty masses. The advantage of packaging in tubular bags is that they are produced economically, and are light. In addition, in terms of storage stability, they are superior to conventional cartridges. A further advantage of tubular bags is that they take up little space when they are empty, since they can be folded to small dimensions.

However, the difficulty in emptying these tubular bags resides in that, contrary to cartridges, tubular bags are not dimensionally stable. Thus, in order to be able to empty such a tubular bag safely and as completely as possible, a device must be created that is designed to solve the problems that arise when these tubular bags are emptied.

From EP 0 592 741, an adapter to hold tubular bags is known, by means of which the tubular bags are inserted into a commercial press-out pistol and emptied by the latter. The adapter consists, in essence, of a tube-shaped cartridge, a press-out piston, a nozzle base part, and the applying nozzle itself. To press out or empty the tubular bag, it is inserted into the cartridge. The cartridge itself is closed in the back by the press-out or emptying piston and on the front side by the nozzle base part, and closed with the applying nozzle in place. The tubular bag is pressed out in the known, manual way by manually actuating a lever which, via a piston rod, pushes the piston forward. To avoid the tubular bag getting jammed between the cartridge and the piston, the piston is V-shaped in the direction of displacement. An adapter of this type is particularly suited to emptying relatively small tubular bags, filled with a low-viscosity mass. On the other hand, the adapter is not suited for highly viscous masses and large tubular bags, since the necessary force cannot be generated with currently available emptying pistols. Furthermore, it is known how difficult it is to keep such manually actuated press-out systems still during the emptying process, since irregular motion is created by the pumping action to displace the piston, due to the coarse gradation of the notches practiced in the displacement rod. This results in erratic control of the device and in the stepwise exit of the pasty mass.

Thus, the object of the invention is to create a repeatedly usable system for the application of pasty masses kept in a tubular bag, which is also particularly suitable for large tubular bags, is of low weight, readily usable and simple to handle.

This object was solved by means of a system for applying pasty masses, said system comprising:

a tubular bag containing a pasty mass; and

a device for emptying said tubular bag and for dosedly applying the pasty mass, characterized in that:

a) the system comprises a base unit which is provided with a hollow cylindrical chamber, the inner diameter of said chamber being essentially equal to the outer diameter of said tubular bag;

b) the chamber is provided with a displaceable piston for emptying said tubular bag;

c) means for actuating the piston are provided for;

d) an extrusion arrangement for applying the pasty mass is provided for; and

e) a sealing cap is provided for obturating the chamber and which can be fixed on said extrusion arrangement.

In one of the preferred embodiments examples of a device to be used in a system, a two-stage nozzle arrangement is provided which, in a first stage, has means to activate one of the components of a two-component mass and which, in a second stage, is equipped with means for homogeneously mixing the two components. A device designed in this manner makes it possible to apply two-component masses that react only after leaving the tubular bag. In this manner, it is possible, for instance, to affect the hardening process of the applied mass in a defined way, or to accelerate it.

Below we shall more clearly explain one embodiment example of the invention, by means of drawings.

Figure 1 shows a first embodiment of a tubular bag.

Figure 1a shows a second embodiment of a tubular bag.

Figure 2 is a schematic representation of a device to empty tubular bags, in a side view.

Figure 3 shows an extrusion, nozzle, arrangement in a longitudinal section.

Figure 3a shows the extrusion arrangement, shown in a cross-sectional view along line A1-A1 of Figure 3.

Figures 4a and 4b show a two-part sealing cover in a longitudinal section.

Figure 5 is the insert of a nozzle arrangement in a view from the back.

Figure 5a shows the insert in a cross-section along line A-A in Figure 5.

Figure 5b shows the insert in a cross-section along B-B in Figure 5.

Figure 5c shows the insert in a cross-section along line C-C in Figure 5B.

Figure 5d is an enlarged section of Figure 5a.

Figure 6 shows a first intermediate part in a cross-sectional view.

Figure 6a shows the first intermediate part in longitudinal view.

Figure 7 shows a second intermediate part in cross-sectional view.

Figure 7a shows the second intermediate part in longitudinal view.

Figure 8 shows an emptying piston in longitudinal view.

Figure 9 shows the emptying piston in a snapshot, while emptying a schematically indicated tubular bag.

Figure 10 shows a second pressing piston in longitudinal section.

Figure 1 shows a first, and Figure 1a, a second embodiment of a tubular bag. The tubular bag S in Figure 1 is closed on both sides by means of a clamp K1, while tubular bag S1 in Figure 1a has a nearly flat bottom. Such a tubular bag, preferably built as a folding bottom bag, is closed by a clamp K1, or is transversely welded on one side and on the other side shows a dimensionally stable connector St, welded to the bag bottom. In addition, at its base, connector St has a circumferential collar Kr. This collar Kr can be round, or have a contour that deviates from a circle, for instance, that of a polygon, a crown, or similar, which corresponds to the opening in the sealing cover. The connector St has an outside thread. In a tubular bag S1, configured as shown in Figure 1a, there is the possibility of including a predetermined breaking point inside connector St. Such a predetermined breaking point should tear open, or break open, in a defined manner at a predetermined pressure acting on tubular bag S1, in such a manner that, inside connector St, an opening is generated,

through which the pasty mass contained in tubular bag S1 can exit. To this end, the wall of tubular bag S1 can be weakened in a defined manner. For instance, such a weakening could be included in the form of a cross, in the wall of the tubular bag. In a preferred embodiment, connector St has a circumferential flange at its base, that overlaps tubular bag S1 on the inside and is there welded to the latter. This flange is indicated by means of broken lines on S1.

Figure 2 schematically shows a lateral view of a system to empty a tubular bag. The system essentially consists of a base unit 1, and extrusion arrangement 2, a sealing cover 3, as well as a drive unit 4, designed to displace an emptying piston included in base unit 1, but not visible in this representation. Base unit 1 is formed by a tubular body, which inside has a hollow cylindrical chamber. This chamber houses the displaceable press-out piston. The internal diameter of the chamber is minimally larger than the outside diameter of the tubular bag it will contain, so that the latter is form-fittingly enclosed by the base unit during emptying. Base unit 1 has external threads at both extremities. At the front outside thread of base unit 1 is attached the extrusion arrangement 2, by means of sealing cover 3, while base unit 1 is screwed into drive unit 4 at its back end. Drive unit 4 is designed as a module and has a casing section 5 at the underside of which is arranged a handle 7, equipped with a means of activating the drive unit, such as a trigger (8) (activation organ). The drive unit module 4 may comprise an electromotor assembled with a coupling means. In casing section 5 is included an electric motor, as well as its coupled transmission. The transmission is coupled to a toothed rack which, in turn, is actively connected to the press-out piston. The toothed rack is indicated in outline and has the reference number 11. At the end of the toothed rack 11, there is a hook 12, by means of which the toothed rack 11, together with the piston, can be manually pulled back to the starting position, as shall be further explained below. A power source, such as a battery, 9 is provided to store the energy to activate the electric motor and thus, to displace the piston; it can be attached to the underside of handle 7.

A clutch is provided to establish a non-positive connection between the electric motor and toothed rack 11 or the piston, respectively. This preferably electromechanically actuated clutch couples automatically when activation organ 8 is depressed, while it decouples automatically as soon as activation organ 8 is released. When activation organ 8 is depressed, the electric motor is also activated. However, when the electric motor is not activated, the clutch is decoupled in such a way that the piston can be manually pulled back to its starting position via toothed rack 11.

This is useful, in that the piston can be manually pulled back to its starting position once a tubular bag has been completely emptied. Since such driving means are known in principle, it would be redundant to enter into greater detail on their design.

Figure 3 shows extrusion (nozzle) arrangement 2 in a longitudinal view and Figure 3a, shows it in a cross-section along line A1-A1 in figure 3. Extrusion arrangement 2, as shown here, was designed for the activation of a two-component mass, in which one of the components is integrated into the other in encapsulated form. An example of a two-component mass could be an adhesive, in which the encapsulated component would accelerate the hardening of the adhesive bead applied.

To break open such capsules, extrusion arrangement 2 includes an insert 20 which will be described hereinafter. The extrusion arrangment 2 has a body 14 with a rear section 15 designed in the shape of a funnel, while the front section 16 essentially is shaped like a hollow cylinder. Finally a removable piece 17 is provided. The end of this has a V-shaped recess 29. Due to this V-shaped recess 29, the adhesive is applied in the form of a bead. The front piece 17 is attached with the aid of a quick coupling connection 18 to the cylindrical section 16 in such a way that, when needed, it can be removed by a rotary movement. As a result of having a removable front piece 17, the user is provided with the possibility of checking the degree of hardening of the applied adhesive beads, as it will be explained in more detail later. In order to be able to tighten the extrusion arrangement 2, an annular shoulder 19 is provided on the back section 15 of nozzle body 14.

Figures 4a and 4b show a two-part sealing cover in a longitudinal section, where the two parts of the sealing cover, as well as the extrusion arrangement per Figure 3, are sketched in the position in which they fit together. The sealing cover consists of a first part 31, designed as a swivel nut. This swivel nut 31 has an inner thread 32, on one side, that corresponds to the outside thread at the front end of the base unit. On the other side of swivel nut 31, there is an easily removable, for instance, screwed-down, extension 34, which has an outer thread 33. A front face 35 of this extension 34, serves to support the extrusion arrangement 2. The second part of the sealing cover is designed as a screw-sleeve 37, which has a central opening 39 to receive the extrusion arrangement. Screw-sleeve 37, in addition, has an inside thread 38 that corresponds to outside thread 33 in extension 34 of swivel nut 31. While swivel nut 31 serves to axially support the extrusion arrangement in the

direction of the base unit, the extrusion arrangement can be fixed to swivel nut 31 by means of screw-sleeve 37 on its shoulder 19.

The insert 20 of the extrusion arrangement 2 will be explained in more detail with the aid of Figures 5 to 5d. The insert 20 which serves to break up the capsules and mixing the components, consists of a back breaking-up arrangement 21 and a front mixing element 23. The back breaking-up arrangement 21 has a number of annular baffles 22 which delineate passage openings in the form of slit 25. Star-shaped struts 24 are provided for supporting baffles 22. It can be seen from Figure 5d that the baffles 22 have an essentially triangular profile when looked at in cross-section, as a result of which a conically narrowing inlet region E is formed, which is followed by the passage openings 25. The width of the passage openings 25 between each baffle 22 is chosen so that they are narrower than the statistically averaged outside diameter of the capsules, preferably smaller than $x - \sigma$, where x is the arithmetic mean value and σ is the standard deviation. Due to this design, it is achieved that the majority of the capsules are broken up when they pass through baffles 22 so that the enclosed component is liberated.

From the illustration, we can see that due to the triangular design of baffles 22, a funnel-shaped intake E is produced. The aperture angle α of this intake area E is preferably 120°or less, more preferably 60° or less, even more preferably 30° or less and most preferably 20° or less. The angle is preferably 5°or greater and most preferably 10° or greater. By means of this design of intake area E, any tendency towards clogging up the extrusion arrangement can be minimized.

The front mixing element 23 of insert 20 serves to achieve homogeneous mixing of the liberated component with the other components. The actual mixing elements are slanted small plates 26 supported on bridges 24; the small plates have slits 27. The two components can enter from the back conical section 15 of the nozzle arrangement into the front, cylindrically shaped section 16 of the nozzle arrangement through slits 27 (Figure 3). Based on the arrangement and design of these small plates 26, homogeneous mixing of the two components is achieved. In addition, the pressure drop of such a mixing element is very low in comparison to the conventional mixers in which a number of mixing wings are arranged one after another.

It is self-evident that the number, arrangement and design of these mixing plates 26 can be adapted to the specific two-component mixture used. Instead of the

mixing plates 26 shown here, any arbitrary variation of mixing elements is conceivable, for example, mixing wings or wound bridges.

Figure 5a shows a first intermediate member 40 in a cross-sectional view, while Figure 5b shows the intermediate member in a longitudinal view. These intermediate members are introduced between the tubular bag in the base unit and closing cover of the pressing device (piston) intended to protect the base unit as well as the sealing cover from contamination by the mass coming out of the tubular bag. The first intermediary member 40 shows an area essentially designed as a hollow cylinder 41. The foremost area is designed in such a way that when the intermediary member 40 is inserted into the system, it protrudes into the extrusion arrangement. Such intermediary members 40 is used especially in conjunction with tubular bags that have no connector in the outlet area. For instance, the intermediary member can be inserted into the sealing cover, before it is fixed to the base unit. Another variant would be to push the end of intermediary member 40 onto the opened tubular bag, or to fix it directly onto the tubular bag.

Figures 7 and 7a show a second intermediate piece 43, which is provided, in addition, with the multiplicity of protrusions 45, 46, and the ends of which are designed as knife edges. This intermediate piece 43 is also introduced between the tubular bag placed in the base body and the closing cover of the pressing device. Due to these cutting edges 45, 46, the tubular bag is broken up in a defined manner as soon as a certain force is applied on it. The protrusions 45, 46 are supported on narrow strutting 47, 48, between which large areas remain free through which the material leaving the tubular bag can arrive into the nozzle arrangement.

Such intermediate pieces 40, 43 are especially used together with tubular bags which have not attachments in the discharge region. For example, the intermediate piece can be placed into the closing cover before this is attached to the base body. Another variant would consist in attaching the intermediate piece 40, 43 at the end on the opened tubular bag or directly on the tubular bag.

If a tubular bag is equipped with a connector in accordance with Figure 1a, then an extrusion arrangement is preferably used that has an inner thread in its rear section St. Such an extrusion arrangement can be screwed onto the tubular bag's connector. For this variation of the extrusion arrangement, a single-part sealing cover has been designed, with a central opening that corresponds to the contour of collar Kr (Figure 1a), such that the opening or, respectively, the collar's contour, is shaped like a polygon. Once the connector on the tubular bag has been guided

through the opening in the sealing cover, the extrusion arrangement can be screwed onto the tubular bag's connector. If the connector's collar is shaped as a polygon, then the tubular bag and, with it, the tightly connected extrusion arrangement are protected against rotation in the sealing cover. As an example, the contour of the opening in the sealing cover and the shoulder of the connector can be octagonal in shape. This makes it possible to rotate the tubular bag, together with the extrusion arrangement, in steps of 45° at a time. The minimal angle of rotation, of course, becomes smaller, as the number of sides on the polygon increases. The possibility of rotating the extrusion arrangement may be important, in connection with the recess in the nozzle tip, since the position of this recess is important to the strand being applied, or to its shape.

Figure 8 shows a longitudinal section of a possible embodiment of a press-out piston 50 to empty tubular bags. Base unit 1 is shown in Figure 2, in which piston 50 is located in a displaceable manner. The press-out piston 50 has a cylindrical section 51 with a shoulder at the front end. On the foremost face side of press-out piston 50, there is an axial, cylindrical extension 52, designed to accept disk 60 provided with a central opening. To facilitate the most complete emptying possible of the tubular bag, the outside diameter of disk 60 is at least as large as the outside diameter of the tubular bag, but only negligibly smaller than the inside diameter of the base unit. In addition, cylindrical extension 52 has a central bore 53, which serves to receive the clamp attached at the end side of the tubular bag. Press-out piston 50, furthermore, has a radial extension 54 that runs diagonally outward, the size of which corresponds at least approximately to the inside diameter of chamber 13, limited by base unit 1. Furthermore, the outward tapering extension 54 can have radial incisions which, however, cannot be seen in this illustration. By means of such incisions, a series of individual, springy tongues are formed that can fit miscellaneous irregularities in the base unit's internal contour. In the area of the back end of piston 50, there is a circumferential shoulder, into which a groove has been inserted to receive a sealing ring 56. The toothed rack 11 provided to displace piston 50 has been drawn in as outlined. To facilitate deairing of chamber 13 when piston 50 is displaced, the latter is equipped with a radial passage 58. This passage can be helpful also during manual pulling back of press-out piston 50, namely, when the piston is to be pulled back to its starting position with the sealing cover in place.

Figure 9 shows a piston in accordance with Figure 8, in a snapshot, while emptying a schematically indicated tubular bag S. The tubular bag end closed by

clamp K1 is housed in the central bore 53 of press-out piston 50. Tubular bag S is emptied by the displacement of press-out piston 50. In the process, the tubular bag wrap H is squeezed and pressed out between ring 60 and the walls of base unit 1. As the press-out piston is moved forward, the emptied tubular bag wrap H is folded, on the side oriented towards the longitudinal central axis M of press-out piston 50, of the inclined extension 54. Ring 60, pushed over extension 52 of piston 50, prevents the tubular bag wrap from lying snugly over press-out piston 50 or, respectively, over its cylindrical portion 51. Tests in this sense have shown that the removal of the emptied tubular bag without such a ring would be possible only with high application of force, if at all. It must be taken into account that section 51 of press-out piston 50, designed to hold the emptied tubular bag, would have to have a larger diameter, without the ring, so that tubular bag S could be emptied sufficiently to begin with. When the emptied tubular bag S is removed from press-out piston 50, it is pulled off piston 50 together with ring 60, which is possible without any great exertion of force.

Figure 10 shows another variation of a pressing piston 62. Piston 62 is provided with a recess 65 on the side facing the tubular bag. This serves for accepting the folded tubular bag. In order to achieve well-defined folding of the tubular bag, piston 62 has a lip 63 which is V-shaped when looking at the cross-section; this lip goes all around. Furthermore, a central extension 64 is provided I which the piston rod 11 is anchored, the extension 64 narrows toward the front and protrudes above lip 63 in the longitudinal direction. Both extension 64 as well as lip 63 pas into recess 65 of piston 60 through rounded surfaces r, R. This design insures that the empty folded tubular bag can be removed - pulled - from the extension 64 without any strong force being necessary.

Instead of a piston 50 activated by a toothed rack 11, a pneumatically activated piston could also be used, for instance. In this case, the toothed rack would not be necessary. In order to be able to manually displace the piston even so from its final to its initial position, the piston could, for instance, be equipped with a hook, to which a cable control could be attached, and guided out of the systems casing. A stop motion device, like an eyelet, for instance, could be provided at the end of the cable control, to limit the piston's forward motion. This could be necessary also when the piston is pneumatically activated without tubular bags inserted, and/or without the sealing cover in place. In addition, this stop motion device is also recommended to pull back the piston. In a pneumatically activated piston, it is also recommended to close the axial passage, for instance, by means of a pressure control valve. For this

case, a drain valve could be installed. To be able to see the level of the tubular bag from the outside, it could be advantageous to place appropriate markings on the toothed rack or the cable control.

Below we shall briefly describe how a tubular bag is pressed out by means of the system described above.

Before introducing a tubular bag into the system, the sealing cover is removed and the sealing piston is manually pulled back to its starting position, by means of the toothed rack. After that, the tubular bag can be inserted into the system's base unit and the extrusion arrangement attached to the base unit by means of the sealing cover. The tubular bag is emptied by depressing the activation organ on the handle, whereby the electric motor or, respectively, the transmission, is coupled through the clutch with the toothed rack and the piston is displaced forward. As soon as the force exerted by the piston on the tubular bag exceeds a certain value, the tubular bag tears in a defined manner at the predetermined breaking point. The pasty mass is thus able to exit the tubular bag and can be applied at the desired location through the extrusion arrangement. Once the desired quantity of the pasty mass has been applied, the process is stopped by releasing the activation organ. This interrupts the connection between the electric motor and the toothed rack, which immediately stops the exit of the pasty mass, since force is no longer exerted on the press-out piston via the toothed rack and, hence, on the tubular bag, rather relieving the latter.

Before any further emptying of the tubular bag (it is assumed that it was not completely emptied), the application nozzle would normally have to be replaced, since it is filled with the meanwhile hardened mass. After this replacement, the process can be continued. If the degree of hardening of the applied mass has to be checked, then the tip of the extrusion arrangement can be separated at the location designed for this, permitting verification of the degree of hardening of the pasty mass in the range of the separated nozzle tip. Testing the hardening process in this manner is very realistic, since the diameter of the nozzle tip in the separated area corresponds approximately to the thickness of the strand applied.

A system like this is particularly suited to emptying tubular bags with a content of approximately 300 mL or greater, more preferably 450 mL or greater and most preferably 1 liter or greater to 3 liters. The system constitutes an easily handled press-out pistol, by means of which the most diverse pasty masses can be applied. The system can, for instance, be used to apply a bead of adhesive at the time a

vehicle window is installed or replaced. Since such a system constitutes an autonomous, mobile unit, it is also suitable for on-site utilization.

In order to be able to empty tubular bags also at low external temperatures, there are aids available that ensure that the mass to be applied is kept at a given temperature. To this end, electric resistance heating can, for instance, be provided, attached to the outside of the base unit, to heat the base unit, together with the tubular bag inserted in it, to a preset temperature. It is obvious that such a resistance heater will be equipped with a power cord so that, when needed, it can simply be connected to a power source, or disconnected from it, respectively.

Heating bags or heating boxes are also conceivable, which would keep the entire system or, respectively, one or more tubular bags, at a predetermined temperature, until their use.

It should be added that the embodiment example described above is by no means to be considered limiting in nature. Thus, in addition to the embodiment example illustrated, countless other variations of the system and the tubular bags are conceivable.

For instance, the press-out piston in the system could be activated electrically, manually or pneumatically, as already suggested. In the case of pneumatic activation, a pressure tank filled with a fluid medium under pressure could be provided inside the system, that could be filled externally, which, when activated, applies pressure to the sausage pack. Instead of a toothed rack, a different power transmission organ, such as a spindle, could be chosen.

To break open capsules, the extrusion arrangement could be equipped with a means in disk form, instead of using baffles, which would have arc-shaped or circular slots. A perforated plate is also conceivable. As elements to break open the capsules, instead of static elements, as represented by the baffles, dynamic elements could be used, such as rotating propellers, turning rollers, or similar elements.

It would also be possible, for instance, to use tubular bags equipped unilaterally with connectors that are not threaded. Naturally, the device can also be used for emptying tubular bags which contain a one-component material. In this case, the use of the nozzle arrangement can be omitted.

WHAT IS CLAIMED IS:

1. A device for applying pasty masses, said system comprising:

a tubular bag (S, S1) containing a pasty mass and

a device for emptying said tubular bag (S, S1) and for dosedly applying said pasty mass, characterized in that:

a) said system comprises a base unit (1) which is provided with a hollow cylindrical chamber (13), the inner diameter of said chamber (13) being essentially equal to the outer diameter of said tubular bag (S, S1);

b) said chamber (13) is provided with a displaceable piston (50) for emptying said tubular bag (S, S1);

c) means for actuating (8) said piston (50) are provided for;

d) an extrusion arrangement (2) for applying said pasty mass is provided for; and

e) a sealing cap (31, 37) is provided for obturating said chamber (13) and which can be fixed on said extrusion arrangement (2).

2. A device according to Claim 1, characterized in that the piston 50 has a peripheral extension (54) which is radially outwardly inclined, and that that portion of said extension (54) which is directed towards the longitudinal center line (M) of said piston (50) is designed so as to function as guiding means for a defined folding of the exhausted tubular bag wrap (H) and the diameter of which is equal to the inner diameter of said chamber.

3. A device according Claim 1 or 2, characterized in that said piston (50) is provided with an axial cylindrical prolongation (52) which is designed for receiving a disk (60) provided with a central opening, the outer diameter of said disk (60) being essentially equal to the inner diameter of said chamber (13), but larger than the diameter of the portion (51) which is to be directed towards said tubular bag (S).

4. A device according to any one of Claims 1 to 3, characterized in that said piston (50) is provided with a cable control, by means of which said piston (50) can be manually removed back to its starting position.

5. A device for use in a system according to any one of Claims 1 to 4 for emptying tubular bags containing a two-component mass, one of said components being embedded in encapsulated form in the other component, said capsules being

mechanically or thermally breakable, characterized in that said extrusion arrangement (2) comprises, as a first stage, means (22) for breaking up said capsules, and, as a second stage, members (26) for intermixing the liberated component with the other component.

6. A device according to Claims 1 to 5, characterized in that said means for breaking up said capsules are baffles (22) which define discharge openings (25), the passage cross-section of which is smaller than the statistical average outer diameter of said capsules, preferably smaller than $x - \sigma$.

7. A tubular bag for use in a system according to any one of Claims 1 or 6, characterized in that said tubular bag (S1) comprises, in one of its end regions, a hollow, cylindrical, dimensionally stable connection piece (St).

8. A tubular bag according to Claim 7, characterized in that said foil is provided with a predetermined breaking point which bursts or breaks on a predetermined pressure acting on said tubular bag (S1), thus creating an opening in said connection piece (St) through which said pasty mass contained in said tubular bag (S1) can emerge.

9. The use of a device having the features of one or several of Claims 1 to 8 for applying adhesive strands to vehicles in the mounting of glass panels.

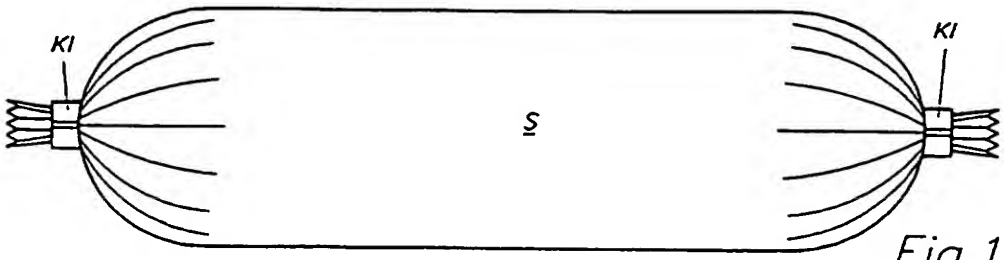

Fig. 1

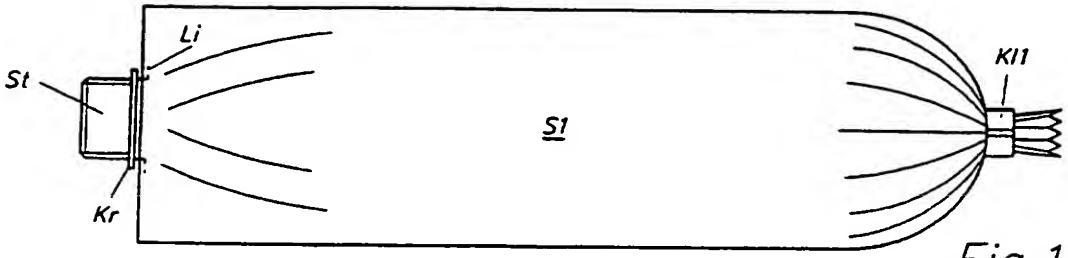

Fig. 1a

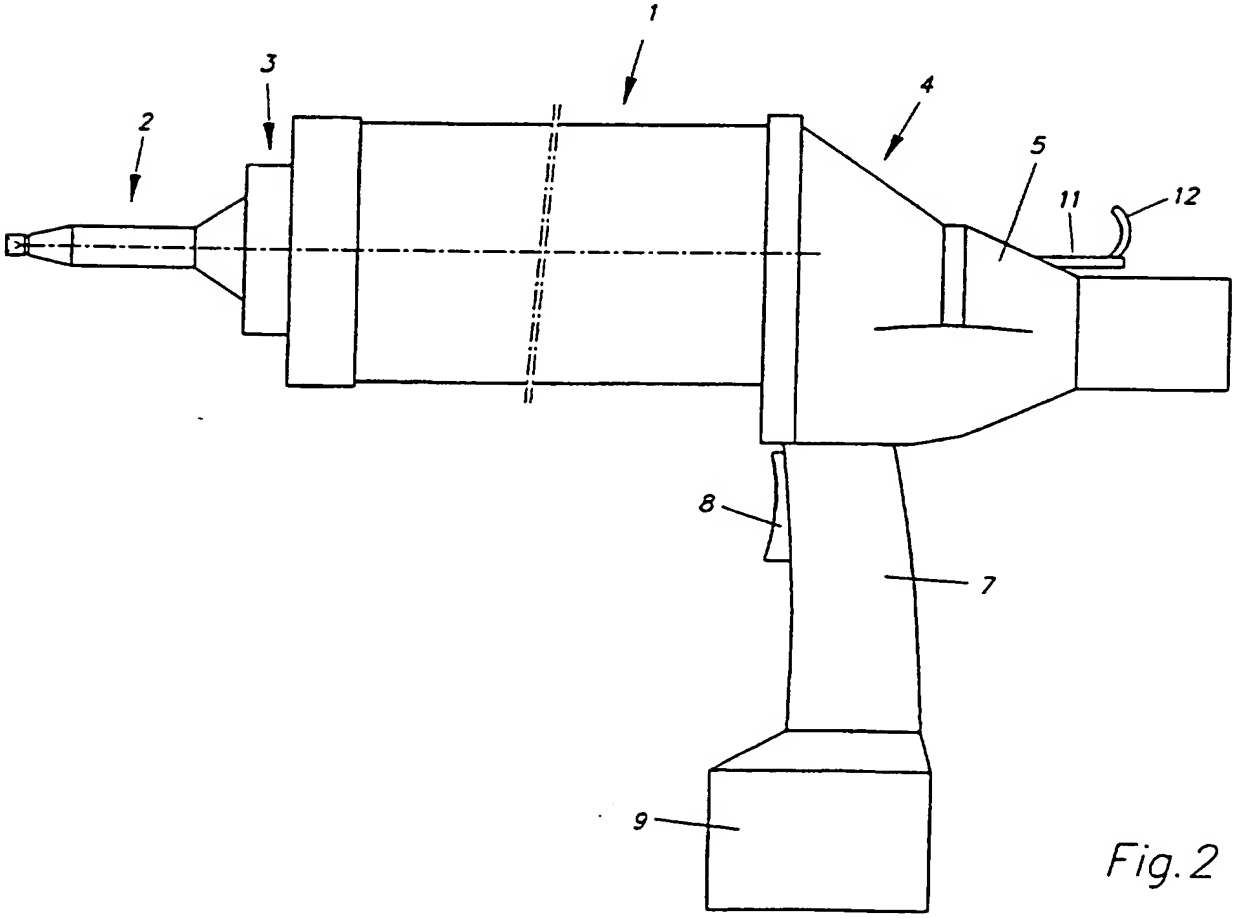

Fig. 2

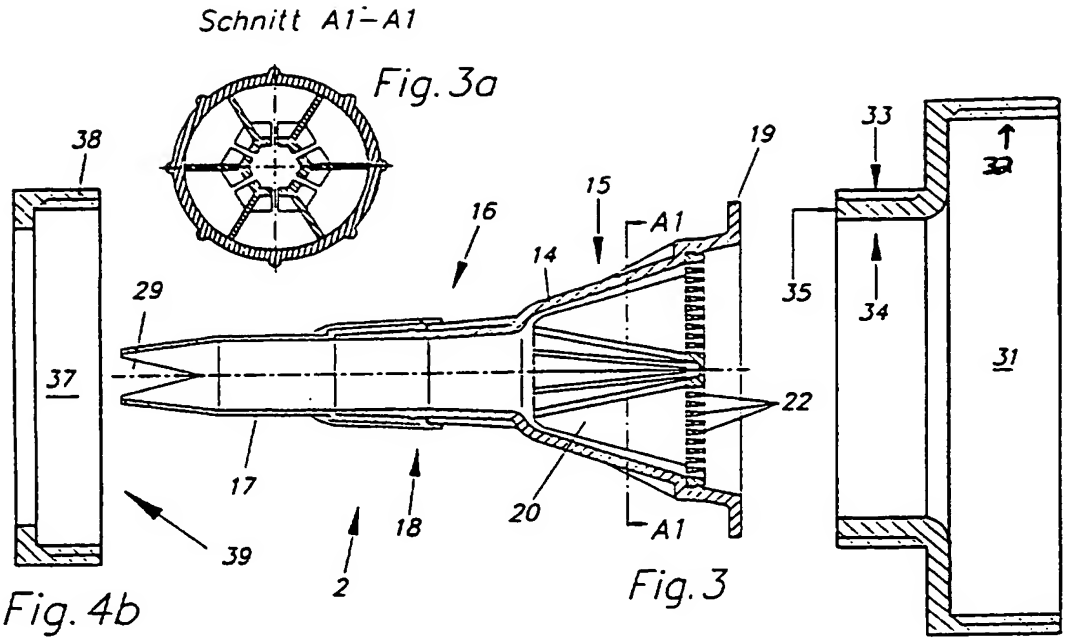

Fig. 3a

Fig. 4b

Fig. 3

Fig. 4a

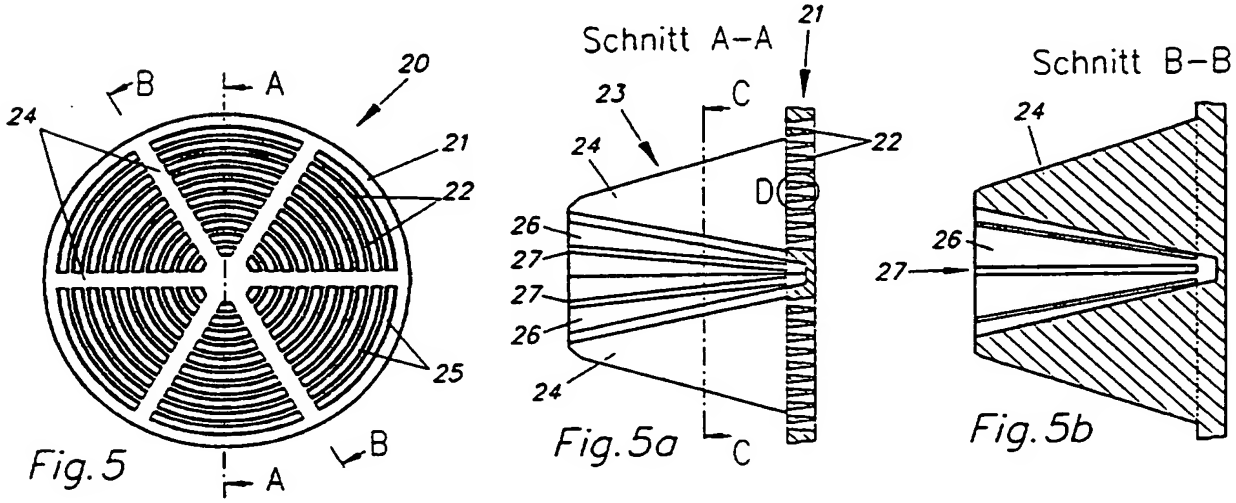

Fig. 5

Fig. 5a

Fig. 5b

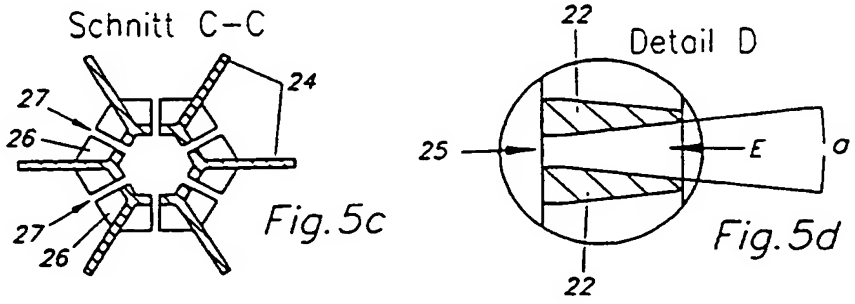

Fig. 5c

Fig. 5d

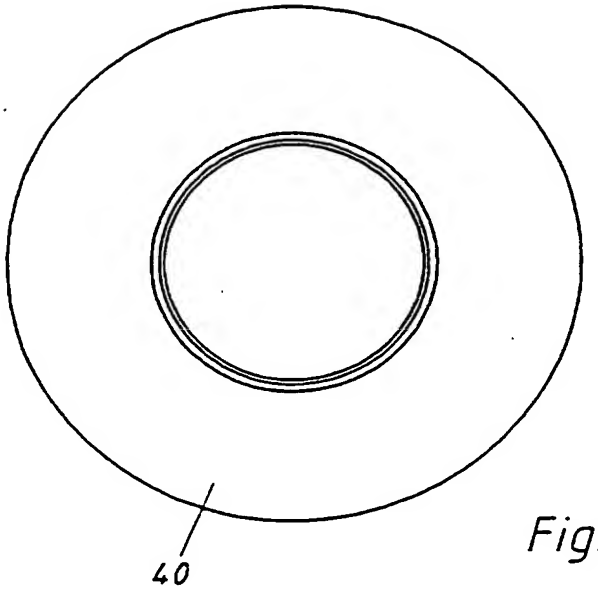

Fig.6

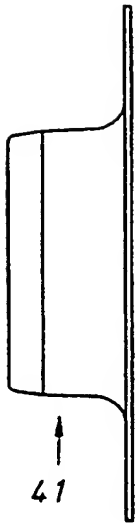

Fig.6a

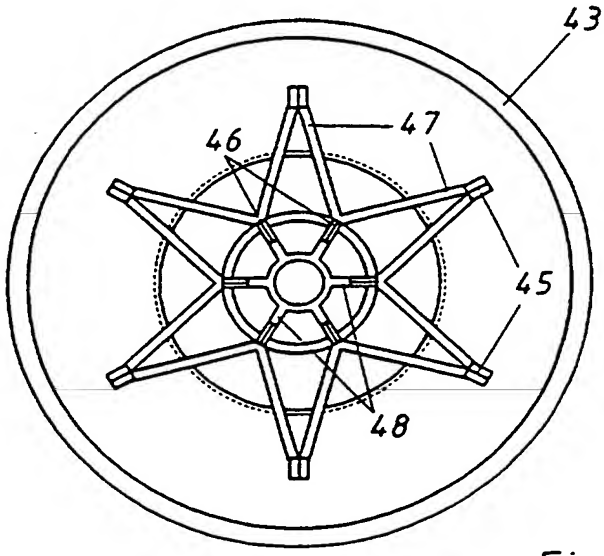

Fig.7

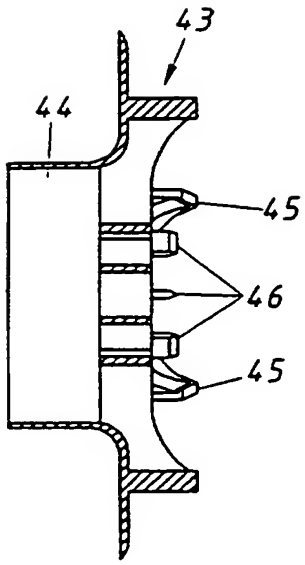

Fig.7a

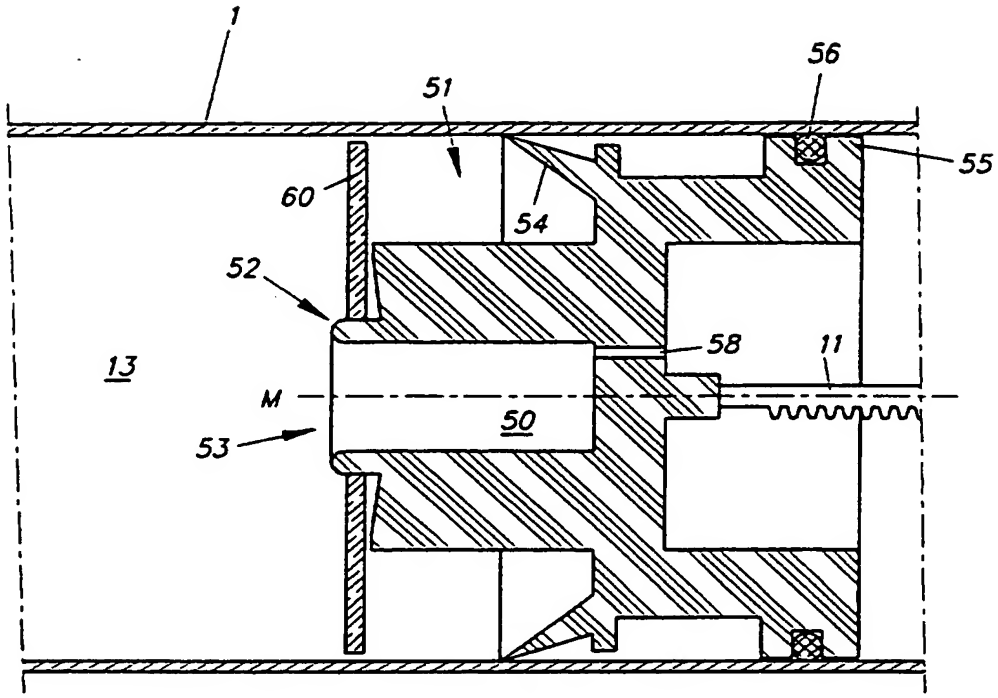

Fig. 8

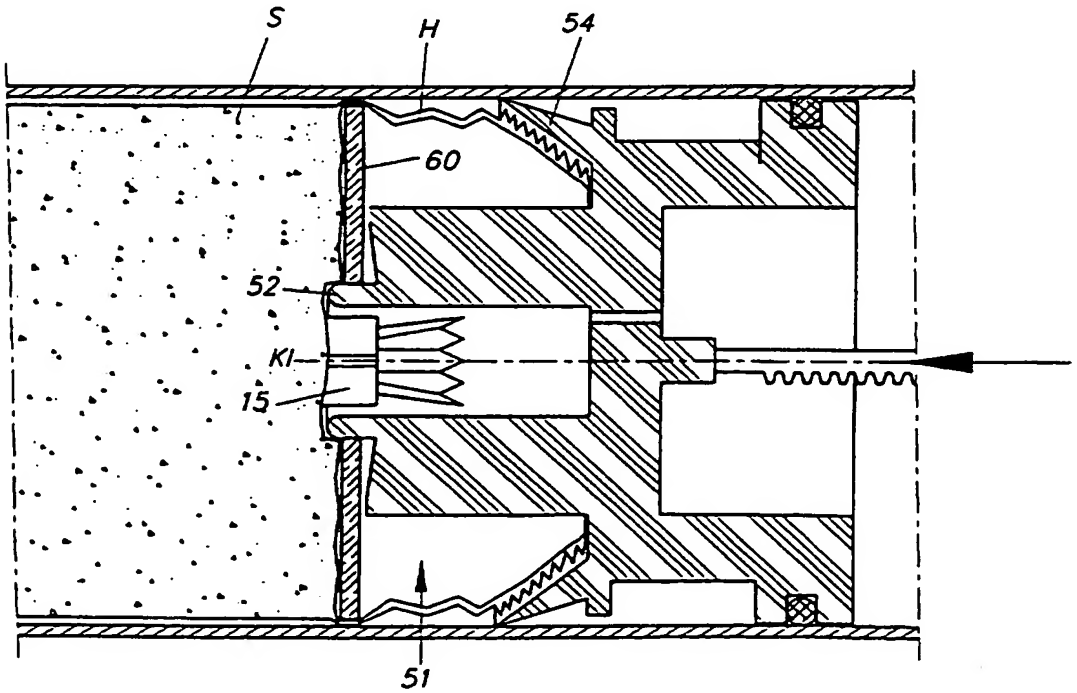

Fig. 9

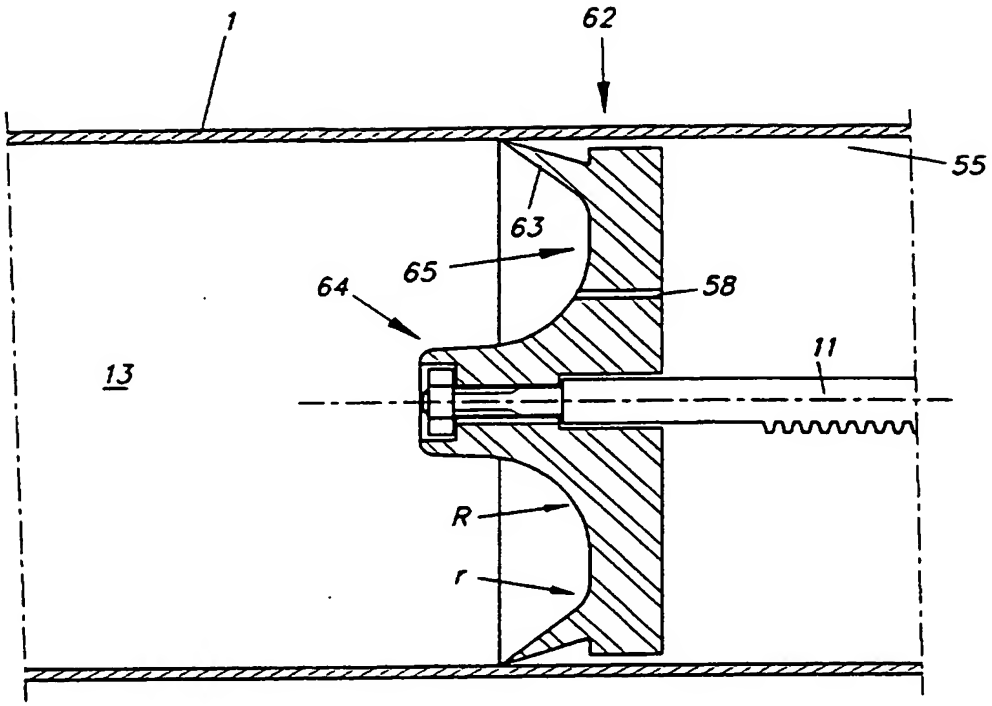

Fig. 10

INTERNATIONAL SEARCH REPORT

Inter nal Application No
PCT/US 97/00282

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 B05C17/01 B05C17/005

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 B05C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 40 42 065 A (SCHNEIDER FRIEDHELM ;SCHROEDER HORST (DE)) 2 July 1992 see the whole document ---	1,2
X	GB 2 186 544 A (CHEMENCE LTD) 19 August 1987 see the whole document ---	1,2,7
X	US 4 986 444 A (CORSO DOMINIQUE) 22 January 1991 see the whole document ---	1,2
X	DE 92 10 904 U (SCHNEIDER) 12 November 1992 see the whole document ---	1,2
X	CH 669 165 A (SIKA AG) 28 February 1989 see the whole document ---	1,2

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
22 April 1997	14. 05. 97

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+ 31-70) 340-2040, Tx. 31 651 epo nl, Fax (+ 31-70) 340-3016	Juguet, J

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INTERNATIONAL SEARCH REPORT

Intern nal Application No
PCT/US 97/00282

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 279 922 A (SCHNEIDER FRIEDHELM) 31 August 1988 see column 3, line 27 - line 33 ---	4
A	US 3 826 580 A (BOHLI W) 30 July 1974 see the whole document -----	5

1

INTERNATIONAL SEARCH REPORT

...formation on patent family members

Inter nal Application No
PCT/US 97/00282

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EP 0279922 A	31-08-88	DE 3704210 A US 4865229 A	25-08-88 12-09-89
US 3826580 A	30-07-74	NONE	